



## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference F18303 SCF	<b>FOR FURTHER ACTION</b>		See Form PCT/PEA416
International application No. PCT/IB2004/003194	International filing date (day/month/year) 30.09.2004	Priority date (day/month/year) 03.10.2003	
International Patent Classification (IPC) or national classification and IPC E21C37/16, F42D1/20, F42D1/22			
Applicant INTERNATIONAL TECHNOLOGIES, LLC et al			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 807 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input checked="" type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 02.08.2005		Date of completion of this report 09.01.2006	
Name and mailing address of the International preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Garrido Garcia, M Telephone No. +31 70 340-4468 	

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**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

**10/574324**

International application No.  
PCT/IB2004/003194

**IAP20 Rec'd PCT/PTO 03 APR 2006**

**Box No. I Basis of the report**

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements\* of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-9 as originally filed

**Claims, Numbers**

1-12 filed with telefax on 14.12.2005

**Drawings, Sheets**

1/5-5/5 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-12
	No: Claims	
Inventive step (IS)	Yes: Claims	1-12
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-12
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

**see separate sheet**

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(SEPARATE SHEET)**

International application No.

PCT/IB2004/003194

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**(Prior art)** Document D1 (WO 02/42711) discloses a method of blasting rock by means of pressure waves generated in a tamped drilled hole, the method including

- forming a stemming plug by holding a stemming material (344) in a container (342) at a predetermined spacing from a surface (332) formed by a bottom of the drill hole by means of a frangible spacer (343) abutting said surface (332) and corresponding to said predetermined spacing and being connected to the container (342), the container (342) and the spacer (343) forming a sacrificial blasting accessory (see page 14, line 25),
- locating a pressure generating substance (350) adjacent the container (342) remote from the bottom (see figure 8),
- initiating said pressure generating substance (350) to cause the stemming material (344) to be displaced at speed toward the bottom (332, see page 14, line 25).

**(Novelty)** The subject-matter of claim 1 differs from this known method in that the container is of a defined volume and includes an openable and closable closure and by the initial method step of filling, in use, the container with a correspondingly defined volume of stemming material and closing the container by means of the openable and closable closure. The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

**(Objective problem)** The feature differentiating claim 1 from the method of D1 enables a more precise selection of the type and amount of stemming material to be used in accordance with the conditions present on site during use.

**(Inventive step)** Containers for holding stemming material are known (see Document D2 (WO 00/60301)). Said containers have a fixed amount of stemming material set at the manufacturing plant, which cannot be modified afterwards. There are no indications in the prior art toward a container that offers the flexibility attained by the method of claim 1, which is therefore considered inventive.

**(Other claims)** Claim 6 relates to the container as used in the method of claim 1, and is therefore also new and inventive. Claims 2-5 and 7-12 are respectively dependent from

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(SEPARATE SHEET)**

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claims 1 and 6, and are therefore also new and inventive.

**Re Item VII**

**Certain defects in the international application**

The description is not in conformity with the claims as required by Rule 5.1(a)(iii) PCT, the reason being that the statement of the invention in the introductory part of the description relates to spacing the stemming from a surface, when in accordance with the characterising portion of claims 1 and 6 the invention relates to the container used.

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.

CLAIMS:

1. A method of blasting or breaking rock or other materials by means of pressure / shock waves generated in a tamped drill hole, the method including

forming a stemming plug by holding a stemming material in a container at a predetermined spacing from a surface formed by a bottom of the drill hole by means of a frangible spacer abutting said surface and corresponding to said predetermined spacing and being connected to the container, the container and the spacer forming a sacrificial blasting accessory;

locating a pressure generating or shock wave generating substance adjacent the container remote from the bottom;

initiating said pressure generating or shock wave generating substance to cause the stemming material to be displaced at speed toward the bottom, characterized in that the container is of a defined volume and includes a openable and closable closure and by the initial method step of filling, in use, the container with a correspondingly defined volume of stemming material and closing the container by means of the openable and closable closure.

2. A method of blasting or breaking rock or other materials as claimed in Claim 1 which is performed in a drill hole which extends downwardly, in which the blasting accessory has a profile slightly smaller than a diameter of the drill hole, the method including causing the blasting accessory to fall under gravity toward said surface.

3. A method of blasting or breaking rock or other materials as claimed in Claim 1 or Claim 2, in which a dilatable and shrinkable seal formation is provided in conjunction with the container, the method including blocking the drill hole by means of said dilatable and shrinkable seal formation when the seal formation is in position, locating a pressure or shock wave generating

substance at said position in the drill hole, and checking and supporting said shock wave generating substance by the seal formation.

4. A method of blasting or breaking rock or other materials as claimed in Claim 3 in which the seal formation is in the form of an inverted skirt, the method including flaring the skirt to cause sealing by pressure exerted by or via the pressure or shock wave generating substance.

5. A method of blasting or breaking rock or other materials as claimed in any one of Claim 1 to Claim 4 inclusive, which includes adjusting an effective length of the spacer in accordance with a desired spacing from said surface.

6. A blasting accessory suitable for use in a drill hole, the accessory including

15 a container for holding stemming material in the form of a plug;  
a spacer connected to the container and extending away from the container a predetermined distance, the spacer having a free end remote from the container for abutting a surface formed by a bottom of a drill hole in use; characterized in that the container has a defined volume and includes an  
20 openable and closable closure to allow the container to be filled, in use, with a correspondingly defined volume of the stemming material and to be closed by means of the closure.

7. A blasting accessory as claimed in Claim 6 which is of generally  
25 round tubular shape, the spacer being in the form of a tube having an open free end, and a vent hole remote from the free end.

8. A blasting accessory as claimed in Claim 7 in which the container is tubular and fits spigot-socket fashion over or within an end of the spacer.

9. A blasting accessory as claimed in Claim 8 in which one end portion of the container is a securing end portion and is in the form of an open-ended sleeve fitting over an end of the spacer.

5 10. A blasting accessory as claimed in Claim 8 in which an opposed end portion of the container is a container end portion and is closable to hold the stemming material, the opposed end portions of the container being divided by means of an internal shoulder arranged to abut the spacer to set the depth of overlapping and thus the volume of the container.

10 11. A blasting accessory as claimed in any one of Claim 6 to Claim 10 inclusive, which includes a deformable seal formation in the form of a rim for sealing against an inner periphery of the drill hole to form a plunger for holding a pressure generating or shock wave generating substance adjacent the container  
15 remote from the spacer.

12. A blasting accessory as claimed in Claim 11 in which the deformable rim is in the form of an inverted skirt having longitudinal slits to render it deformable or to facilitate deformation, in respect of both shrinking  
20 and dilating.